

Functional Science Goals at a Glance

Goal 1 - NATURE OF SCIENCE

Students will explore, evaluate, and communicate personal and scientific investigations to understand the nature of science.

Goal 2 - PHYSICAL SCIENCE

Students will use appropriate scientific models to describe and quantify the nature and interactions of matter and energy.

Goal 3 - LIFE SCIENCE

Students will describe structures and attributes of living things, processes of life, and interaction with each other and the environment.

Goal 4 - EARTH/SPACE SCIENCE

Students will analyze the composition, formative processes, and history of the universe, solar system and Earth.

Goal 5 - SCIENCE, TECHNOLOGY, ENVIRONMENT AND SOCIETY

Students will identify and evaluate the relationships and ethical implications of science, upon technology, environment, and society.

Goal 1 - NATURE OF SCIENCE

Students will explore, evaluate, and communicate personal and scientific investigations to understand the nature of science.

Indicator 1: Understand the nature, values, and application of scientific knowledge.

Benchmarks:

- a. Demonstrates sensory awareness of environment.
- b. Explores environment through senses.
- c. Explore and participates in group scientific activity.

Functional Standards

- ☐ 1. Demonstrates an observable behavioral change when stimulated (tactile, auditory, visual).
- ☐ 2. Inspects surroundings.
- ☐ 3. Uses hands and mouth for sensory exploration of objects.
- ☐ 4. Looks for an object no longer visible.
- ☐ 5. Identifies objects by sounds.
- ☐ 6. * Actively participates in science activities.
- ☐ 7. * Observes and asks questions about the world around them (e.g. Where does rain come from?).
- ☐ 8. * Shows an interest in and willingness to investigate unfamiliar objects and events.

- ❑ 9. * Asks questions and explores the world around them.
- ❑ 10.* Uses investigations in science to answer different questions.
- ❑ 11.* Uses investigations in science to serve different purposes (e.g. exploring the world).
- ❑ 12.* Understands that science involves asking and answering questions and comparing the results to what is already known.

Indicator 2: Demonstrate understanding and use a variety of processes for scientific investigations.

Benchmarks:

- a. Uses senses to make observations.
- b. Uses senses and simple problem solving to make predictions.
- c. Understands and participates in group scientific exploration.
- d. * Demonstrates safety when engaged in scientific activities.

Functional Standards

- ❑ 1. Explains what senses are for.
- ❑ 2. * Uses their senses and simple instruments to make observations (e.g. magnifying glasses, balance scales, thermometer).
- ❑ 3. * Uses non-standard units of measurement to compare objects.
- ❑ 4. * Enhances observations by using senses and simple instruments to identify differences in properties.

- ❑ 5. * Uses scientific thinking skills (e.g. observing, communicating, classifying, comparing, predicting).
- ❑ 6. * Measures length, volume, mass and temperature in appropriate units.
- ❑ 7. * Makes predictions based on observations rather than random guesses.
- ❑ 8. * Makes specific predictions and observations concerning a situation.
- ❑ 9. * Use proper safety procedures in all investigations (e.g. fire safety, machine safety, chemical safety...etc.).
- ❑ 10.* Applies basic science process skills (e.g. observing, classifying, measuring, communicating, predicting, and inferring).

Goal 2 - PHYSICAL SCIENCE

Students will use appropriate scientific models to describe and quantify the nature and interactions of matter and energy.

Indicator 1: Describe structures and properties of matter in various states and forms.

Benchmarks:

- a. * Identify observable properties of matter.
- b. * Recognize that matter exists smaller than the eye can see.

Functional Standards

- ☐ 1. * Uses sensory descriptors to describe objects (e.g. sweet, sour, rough, smooth).
- ☐ 2. * Explores objects in terms of physical attributes.
- ☐ 3. * Finds similarities and differences of various objects.
- ☐ 4. * Observes and describes how objects in the world vary greatly in their properties.
- ☐ 5. * Compares relative mass of objects (e.g. which object is heavier, lighter).
- ☐ 6. * Creates mixtures and separates them based on differences in properties. (e.g. separate rocks and sand using a screen).
- ☐ 7. * Investigates and describes basic properties of solids, liquids, and gases.
- ☐ 8. * Classifies objects by their physical properties.
- ☐ 9. * Classifies matter by its state.

- ❑ 10.* Describes physical properties of objects.
- ❑ 11. Explores how different materials can be made by physically combining substances (e.g. student made paste).
- ❑ 12. Differentiates between the states of matter when matter changes (e.g. from a solid to liquid).
- ❑ 13. Identifies changes that can occur in the physical properties of the ingredients in a solution (e.g. sugar dissolving in water).
- ❑ 14. Describes the effect of various external energies on the states of matter (e.g. temperature, mechanical, chemical).

Indicator 2: Describe physical and chemical changes in matter.

Benchmarks:

- a. * Explore ways that matter can change.
- b. * Explore the effects of physical changes on common materials.

Functional Standards

- ❑ 1. Observes changes in food from one state to another (e.g. raw to cooked, popcorn).
- ❑ 2. Puts foods that require refrigeration in refrigerator or freezer.
- ❑ 3. Classifies the three states of matter.
- ❑ 4. * Studies water in solid and liquid form.
- ❑ 5. * Observes physical changes in matter (e.g. melting, freezing, bending, tearing).

- ❑ 6. * Experiments with water to determine how common materials interact with it (e.g. floating, sinking, dissolving).
- ❑ 7. * Observes how some substances dissolve more easily in hot water rather than cold.
- ❑ 8. * Investigates and understands processes associated with changes in matter from one state to another (e.g. condensation, evaporation, melting, freezing, expanding, contracting).
- ❑ 9. * Explores how different materials can be made by physically combining substances (e.g. student made paste, simple cooking activities).

Indicator 3: Analyze fundamental forces, their forms, and their effects on motions.

Benchmarks:

- a. * Explore relationships between force and motion.
- b. * Explore the forces and motions of moving objects.

Functional Standards

- ❑ 1. * Explores magnetism, describes its effect on various materials, observes that magnetic force can pass through various materials and that some magnets have useful applications.
- ❑ 2. * Describes the motion of various objects found in their world (e.g. cars, swings, straight, circular and back and forth).

- ❑ 3. * Describes how pushes or pulls can change motion of an object.
- ❑ 4. * Describes motions of common objects in terms of speed and direction.
- ❑ 5. * Explores how the movement of objects influence other objects (e.g. collision of marbles).
- ❑ 6. * Predicts the effects of force on objects (e.g. water, wind).
- ❑ 7. * Describes how things can move or be made to move.
- ❑ 8. * Explores ways to make objects move faster or slower or in a different direction.
- ❑ 9. * Discusses and makes predictions about moving things (e.g. insects, birds, fans).
- ❑ 10.* Investigates simple machines (e.g. lever, pulley, wheel, axle, inclined plane, wedge, screw).
- ❑ 11.* Identifies types, examples, and functions of simple machines.
- ❑ 12.* Explains the cause and effect of motion.
- ❑ 13.* Investigates the way sources of energy do work.
- ❑ 14.* Describes how machines make work easier, trading force for distance.
- ❑ 15.* Observes simple and complex machines to determine how the machines make work easier.

Indicator 4: Analyze interactions of energy and matter.
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Benchmarks:

- a. * Explore different forms of energy.
- b. * Explore energy transfers.

Functional Standards

- ❑ 1. Learns how to control environmental energy (e.g. use of switches, plugs, control of fire).
- ❑ 2. Explores vibration and sound.
- ❑ 3. Determines which of two objects is hotter or colder.
- ❑ 4. * Explores heat sources and the effect on matter.
- ❑ 5. * Associates sounds with vibrating objects.
- ❑ 6. * Investigates sources of energy (e.g. moving water, food).
- ❑ 7. * Explores how the sun applies heat and light to Earth.
- ❑ 8. * Explores how heat can be produced in many ways.
- ❑ 9. * Explores how light can pass through some objects and not others.

Goal 3 - LIFE SCIENCE

Students will describe structures and attributes of living things, processes of life, and interaction with each other and the environment.

Indicator 1: Understand the fundamental structures, functions, and mechanisms found in living things.

Benchmarks:

- a. * Explore ways to classify living things.
- b. * Explore processes in living things.
- c. * Explore structures and functions in living things.
- d. * Identify relationships between structures and functions within an organism.
- e. * Identify ways that living things are organized and classified.

Functional Standards

- ☐ 1. * Sorts living from non-living things.
- ☐ 2. * Describes the basic needs of living organisms.
- ☐ 3. * Recognizes similarities and differences in diverse species.
- ☐ 4. * Compares size, shape and structure of living things (e.g. grasses to trees, birds to mammals).
- ☐ 5. * Describes changes that are part of common life cycles (e.g. seed to flower to fruit to seed).

- ❑ 6. * Describes life needs of green plants (e.g. minerals, air, water, light, and a place to grow).
- ❑ 7. * Classifies plants according to parts (e.g. seeds, roots, stems, fruit).
- ❑ 8. * Analyzes plants according to characteristics (e.g. edible/nonedible, flowering/nonflowering).
- ❑ 9. * Describes life needs of animals, including people (e.g. food, air, water, place to live).
- ❑ 10.* Classifies animals according to physical characteristics (e.g. body shape, appendages).
- ❑ 11.* Observes and cares for pets and/or plants.
- ❑ 12.* Describes similarities and differences of plants.
- ❑ 13.* Describes similarities and differences of animals.
- ❑ 15.* Compares plants and animals in their immediate surroundings with those in other habitats.
- ❑ 16.* Describes how plants go through a series of orderly changes in their life cycle (e.g. flowering plants undergo many changes from the formation of a flower to the development of the fruit).
- ❑ 17.* Classifies and analyzes living things by structure and function (e.g. bird's beak and what the bird eats).
- ❑ 18.* Identifies the basic structures and functions of plants and animals
- ❑ 19.* Understands basic structures and functions in common plants (e.g. leaves, stems, roots, flowers).
- ❑ 20.* Describes how component parts make up the human body system.

Indicator 2: Analyze various patterns and products of natural and induced biological change.**Benchmarks:**

- a. * Identify ways offspring are like their parents.
- b. * Explore ways organisms change.
- c. Explore and explain how plants and animals survive their environment.

Functional Standards

- ❑ 1. * Recognizes that offspring of plants and animals are similar, but not identical to their parents or one another (e.g. pets and/or plants).
- ❑ 2. * Explores ways in which organisms react to changing conditions (e.g. animals' coats change in the winter; people sweat in hot weather and shiver in cold weather).
- ❑ 3. * Describes physical similarities and differences between traits of parents and their offspring.
- ❑ 4. * Explores how organisms are dependent upon each other for survival.
- ❑ 5. * Describes how some animals (frogs and butterflies) go through distinct stages during their lives while others generally resemble their parents throughout most of their lives.
- ❑ 6. * Explains how behavioral and physical adaptations/characteristics allow animals to respond to life needs (e.g. finding shelter, defending themselves, hibernation, and camouflage).
- ❑ 7. * Describes similarities and differences of offspring within families.

Indicator 3: Analyze how organisms are linked to one another and the environment.

Benchmarks:

- a. * Explore ways energy is transferred in a food chain.
- b. * Explore how environmental factors affect living things within an ecosystem
- c. * Identify relationships and interactions of living things.

Functional Standards

- ☐ 1. * Describes the flow of energy in a simple food chain.
- ☐ 2. * Describes ways that plants and animals depend on each other.
- ☐ 3. * Describes factors that affect air and water quality.
- ☐ 4. * Explains the importance of conserving water or other resources at home and school.
- ☐ 5. * Describes ways humans impact air, water, and habitat quality.
- ☐ 6. * Describes how seasonal changes impact life processes of plants and animals.
- ☐ 7. * Explains what happens when factors are eliminated from plant growth (e.g. no water, sunshine).
- ☐ 8. * Describes how seasonal changes affect plants, animals, and their surrounding (e.g. migration, hibernation, camouflage, adaptation, dormancy).
- ☐ 9. * Describes cause and effect relationships in living systems.

Goal 4 - EARTH/SPACE SCIENCE

Students will analyze the composition, formative processes, and history of the universe, solar system and Earth.

Indicator 1: Analyze the various structures and processes of the Earth system.

Benchmarks:

- a. * Identify properties of Earth.
- b. * Identify changes that occur on Earth.

Functional Standards

- ☐ 1. * Explores how shadows are made.
- ☐ 2. * Describes major features of the Earth's surface (e.g. rivers, deserts, mountains, valleys, oceans).
- ☐ 3. * Compares rocks, soil, and sand.
- ☐ 4. * Describes simple Earth patterns in daily life (e.g. weather observations).
- ☐ 5. * Describes how night and day are caused by the rotation of the Earth.
- ☐ 6. * Explains that the sun is the source of heat and light that warms the land, air, and water.
- ☐ 7. * Describes the effects of weather on Earth (e.g. erosion, floods, tornadoes).
- ☐ 8. * Investigates and describes basic types and patterns of weather (e.g. high and low temperature, wind, precipitation, storms).

- ❑ 9. * Describes how weather and seasonal changes affect plants, animals and their surroundings.
- ❑ 10. Describes the importance of soil to plants and animals.
- ❑ 11. Identifies simple geological features (e.g. mountains, valleys).
- ❑ 12. Explores the patterns of nature (e.g. day/night, seasons, life cycle).

Indicator 2: Analyze essential principles and ideas about the composition and structure of the universe.

Benchmarks:

- a. * Identify Earth's place in the solar system.
- b. * Identify natural objects and events outside Earth.

Functional Standards

- ❑ 1. * Describes what causes day and night.
- ❑ 2. * Identifies observable objects in the day and night skies.
- ❑ 3. * Records position and apparent shape of moon over a period of time.
- ❑ 4. * Describes what can be observed in the sky by the unaided eye in the day and at night (e.g. sun, moon, stars).
- ❑ 5. * Observes and identifies the basic components of the solar system (e.g. sun, planets).

**Goal 5 - SCIENCE, TECHNOLOGY, ENVIRONMENT
AND SOCIETY****Students will identify and evaluate the relationships and ethical implications of science, upon technology, environment, and society.****Indicator 1: Analyze various implications/effects of scientific advancement within the environment and society.****Benchmarks:**

- a. * Explore how various tools benefit mankind.
- b. * Explore ways human activity affects the environment.

Functional Standards

- ❑ 1. * Recognizes and uses technology in school, home and community (e.g. switch communication, computer, pencil, refrigerator, Velcro, fire truck).
- ❑ 2. * Describes ways technology makes life easier for people.
- ❑ 3. * Cares for the environment around the school (e.g. litter, paper).
- ❑ 4. * Recognizes ways to reuse various materials.
- ❑ 5. * Describes how technology contributes to solving problems.
- ❑ 6. * Investigates how to recycle and reuse natural resources.

- ❑ 7. * Describes how technology contributes to solving problems.
- ❑ 8. * Explains how technology is applied to daily life.
- ❑ 9. * Models the ways to recycle, reuse, and reduce consumption of natural resources.
- ❑ 10. Explains how inventions have changed peoples lives (e.g. television, electric lights).

Indicator 2: Analyze the relationships/interactions among science, technology, environment, and society.

Benchmarks:

- a. Explore the impact of scientific discoveries on the lives of people.
- b. Explore ways to respond to various environmental hazards.

Functional Standards

Not appropriate for functional standards.

